STOICH REMEDIAL ASSIGNMENT – 50 pts.

Review the following chapters: ionic and molecular formula writing; constructing and balancing chemical reactions; pre-stoich mole calculations.

1) How many r.p. are in one mole?
2) How many L are in one mole of any gas at STP conditions?
3) Explain how there is <u>not</u> one set answer to "How many grams are in one mole?"
4) How is stoichiometry different from non-stoich mole calculations?
5) Explain how the "mole-mole" conversion factor works.
6) List the chemical formulas of the seven diatomic molecules ("Super Seven").

For #7-14, identify the following as ATOM, ION, MOLECULE, or FORMULA UNIT.

7) HCO_3^-
8) $Al(NO_3)_3$
9) Es
10) Cl_2
11) CH_3COO^-
12) NO_2
13) Rn
14) ZnS

For #15-21, give the chemical formulas of the six major acids.

15) Phosphoric acid
16) Carbonic acid
17) Hydrochloric acid
18) Acetic acid (version 1)
19) Acetic acid (version 2)
20) Sulfuric acid
21) Nitric acid

For #22-28, write the complete balanced equations.

22) sulfur trioxide + water → sulfuric acid
23) magnesium + phosphoric acid →

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24) incomplete combustion of C_2H_2

25) aluminum hydroxide + strontium sulfite →

26) sodium bicarbonate (heated) → sodium carbonate + water + carbon dioxide

27) iron + oxygen → iron(III) oxide

28) complete combustion of octane (C_8H_{18})

For #29-36, give a general setup for the following conversions. See the last chapter's practice 6.

29) Convert grams of A to r.p. of B.

30) Convert r.p. of A to g of B.

31) Convert liters of A to grams of B. (at STP)

32) Convert g of A to liters of B. (at STP)

33) Convert r.p. of A to liters of B. (at STP)

34) Convert liters of A to r.p. of B. (at STP)

35) Convert g of A to g of B.

36) Convert mol of A to mol of B.

For #37– solve the problems using the chemical equation below. Watch sig.figs
Show all work and units. When "r.p." is mentioned, be specific in your work and answer. .

$$4\ FeCr_2O_7 + 8\ K_2CO_3 + O_2 \rightarrow 2\ Fe_2O_3 + 8\ K_2CrO_4 + 8\ CO_2$$

37) How many L of oxygen are needed to produce 2.66×10^{22} r.p. of potassium chromate? Assume STP conditions.

38) Calculate the number of L carbon dioxide produced from using 1.926×10^{23} r.p. of potassium carbonate at STP.

39) How many r.p. of iron(III) oxide can be produced from 23.00 g of potassium carbonate?

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$$4\ FeCr_2O_7 + 8\ K_2CO_3 + O_2 \rightarrow 2\ Fe_2O_3 + 8\ K_2CrO_4 + 8\ CO_2$$

40) Calculate the number of moles of oxygen needed to produce 30.0 mol iron(III) oxide.

41) 9.24×10^{23} r.p. of iron(II) dichromate can produce how many g of carbon dioxide?

42) 520 g of potassium chromate will react with how many L of oxygen at STP?

43) How many r.p. of iron(III) oxide will be produced when 8.6 liters of oxygen reacts under STP conditions?

44) Calculate the mass of iron(II) dichromate required to completely react with 77 grams of potassium carbonate.

45) How many moles of potassium chromate are made from using 0.4567 moles of iron(II) dichromate?

46) When 7.50 L of carbon dioxide are produced under STP conditions, how many g of potassium carbonate are used?

47) When 29.0 L of carbon dioxide are made under STP conditions, how many L of oxygen gas are used?

48) Calculate the number of liters of carbon dioxide made from 3.67×10^{21} r.p. iron(II) dichromate. Assume STP conditions.

49) How many g of carbon dioxide will be produced from using 8.8 g iron(II) dichromate?

50) Calculate the number of moles of oxygen needed to produce 1.27 mol of carbon dioxide.